

WHAT IS CLAIMED IS

1. A surface treating process for forming a vapor deposited film from an easily oxidizable vapor-depositing material on the surface of a work, comprising the step of evaporating the vapor-depositing material in a state in which a vapor deposition controlling gas has been supplied to at least zones near a material melting/evaporating source and the work within a treating chamber.
2. A surface treating process according to claim 1, wherein the wire-shaped vapor-depositing material containing the vapor deposition controlling gas is evaporated, while being supplied to the melting/evaporating source, whereby the vapor deposition controlling gas is supplied from said vapor-depositing material.
3. A surface treating process according to claim 2, wherein said vapor deposition controlling gas is hydrogen.
4. A surface treating process according to claim 3, wherein the evaporation of the vapor-depositing material is carried out under a partial pressure of oxygen equal to or higher than 10^{-3} Pa.
5. A surface treating process according to claim 4, wherein the molar ratio of hydrogen to oxygen in at least a space between the melting/evaporating source and the work within the treating chamber is in a range of 10 to 250.
6. A surface treating process according to claim 3, wherein said vapor-depositing material is an aluminum wire having a content of hydrogen in a range of 0.5 ppm to 11 ppm.
7. A surface treating process according to claim 1, wherein the

vapor deposition controlling gas is supplied by introducing it from the outside of the treating chamber.

8. A surface treating process according to claim 7, wherein said vapor deposition controlling gas is hydrogen.

9. A surface treating process according to claim 8, wherein the evaporation of the vapor-depositing material is carried out under a partial pressure of oxygen equal to or higher than 10^{-3} Pa.

10. A surface treating process according to claim 9, wherein the molar ratio of hydrogen to oxygen in at least a space between the melting/evaporating source and the work within the treating chamber is in a range of 10 to 250.

11. A surface treating process according to claim 8, wherein said vapor-depositing material is aluminum having a content of hydrogen equal to or smaller than 0.5 ppm.

12. A surface treating apparatus comprising a treating chamber connected to a evacuating system, a melting/evaporating source for melting and evaporating a wire-shaped vapor-depositing material containing a vapor deposition controlling gas, a member for retaining a work on which the vapor-depositing material is deposited, said melting/evaporating source and said work retaining member being disposed in the treating chamber, and a vapor-depositing material supply means for supplying said wire-shaped vapor-depositing material containing the vapor deposition controlling gas to said melting/evaporating source.

13. A surface treating apparatus according to claim 12, wherein said vapor-depositing material supply means comprises a feed

reel for feeding said the wire-shaped vapor-depositing material.

14. A surface treating apparatus according to claim 12, wherein said vapor deposition controlling gas is hydrogen.

15. A surface treating apparatus according to claim 13, wherein the molar ratio of said vapor deposition controlling gas to oxygen in at least a space between said melting/evaporating source and said work within said treating chamber can be adjusted by the feed rate of said vapor-depositing material fed from said feed reel.

16. A vapor-depositing material which is a wire having a content of hydrogen in a range of 0.5 ppm to 11 ppm.

17. A work having a vapor deposited film formed thereon from at least one metal selected from the group consisting of aluminum, titanium, zinc, tin, lead and bismuth by a surface treating process according to claim 1.

18. A work according to claim 17, wherein said vapor deposited film contains hydrogen.

19. A work according to claim 18, wherein the content of hydrogen in said vapor deposited film is in a range of 1 ppm to 20 ppm.

20. A work according to claim 17, wherein said work is a rare earth metal-based permanent magnet.